REMARKS

This paper is being provided in response to the Office Action dated March 9, 2005, for the above-referenced application. In this response, Applicant has amended claims 1 and 12 to clarify that which Applicant considers to be the invention. Applicant respectfully submits that the amendments to the claims are fully supported by the originally-filed specification.

The rejection of claims 1 and 12 (and their dependent claims) under 35 U.S.C. 112, first paragraph, is addressed by amendments to the claims contained herein. Applicant has clarified the structural relationship of the voltage selecting block and the impedance converter. (See, for example, page 6, line 15 to page 7, line 7 and Figures 2 and 4 of the present application.) Accordingly, Applicant respectfully requests that this rejection be reconsidered and withdrawn.

The rejection of claims 1 and 3-7, 12 and 13 under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 6,160,533 to Tamai et al. (hereinafter "Tamai") is hereby traversed and reconsideration is respectfully requested in view of the amendments to the claims contained herein.

Independent claim 1, as amended herein, recites an LCD control unit for driving an LCD panel in an LCD device. The LCD control unit includes a signal controller for generating a voltage address signal and a polarity control signal. A voltage generator block generates a plurality of (n) γ-voltage levels and a plurality of (m) Vcom-voltage levels. A voltage selecting block selects a specified number of the γ-voltage levels and one of the Vcom-voltage levels based on the polarity control signal to output the specified number of γ-correction voltages and a Vcom voltage, where output of the voltage generating block is selected by said voltage selecting

block from the plurality of (n) γ-voltage levels and the plurality of (m) Vcom-voltage levels according to a value of the voltage address signal, and wherein the voltage selecting block includes an impedance converter, having at least operational amplifier to receive the γ-voltage levels and the Vcom-voltage levels, to convert internal impedances of the γ-voltage levels and the Vcom-voltage levels and generate the specified number of the γ-correction voltages and the Vcom voltage according to a value of the polarity signal. An LCD driver generates a set of display data signals based on a set of external data signals, where the LCD driver receives the specified number of the γ-correction voltages output from the voltage selecting block and includes a γ-correction section for correcting voltages of the display data signals based on the specified number of the γ-correction voltages. Claims 2-7 depend directly or indirectly on independent claim 1.

Independent claim 12, as amended herein, recites a display control unit for driving a display panel in a display device. The display control unit includes a signal controller for generating a voltage address signal and a polarity control signal. A voltage generator block generates a plurality of (n) γ-voltage levels and a plurality of (m) Vcom-voltage levels. A voltage selecting block is coupled to the voltage generator block, wherein an output of the voltage generating block is selected by the voltage selecting block from the plurality n) γ-voltage levels and the plurality of (m) Vcom-voltage levels according to a value of the voltage address signal. The voltage selecting block includes an impedance converter, having at least operational amplifier that to receive the γ-voltage levels and the Vcom-voltage levels, to convert internal impedances of the γ-voltage levels and the Vcom-voltage levels and generate the specified number of the γ-correction voltages and the Vcom voltage according to a value of the polarity signal. A display driver generates a set of display data signals based on a set of external data

signals, where the display driver receives the specified number of the γ-correction voltages output from the voltage selecting block and includes a γ-correction section for correcting voltages of the display data signals based on the specified number of the γ-correction voltages. Claim 13 depends from independent claim 12.

The Tamai reference discloses a method and apparatus for driving a display panel. The system includes a reference voltage having a voltage level that increases or decreases stepwise with time. Gradation display is conducted by applying the voltage level at certain times to electrodes of the display panel. Multi-level gradation display is conducted without increasing the number of terminals to which voltage is inputted or the number of switching elements for applying the voltage to the electrodes. (See col. 5, lines 24-41 and col. 6, line 59 to col. 7, line 12 of Tamai.)

Applicant's independent claims, as amended herein, recite at least the features that a control unit for driving a display panel includes a voltage selecting block that selects output of a voltage generating block from a plurality of γ-voltage levels and Vcom-voltage levels according to the value of a voltage address signal and includes an impedance converter, having at least one operational amplifier to receive the γ-voltage levels and the Vcom-voltage levels, to convert internal impedances of the γ-voltage levels and the Vcom-voltage levels and generate a specified number of γ-correction voltages and one of the Vcom-voltages according to a value of the polarity signal. Applicant has found that the features as recited provides for a display device having enhanced adjustment capability and improved optical characteristics. (See, for example, page 18, line 6 to page 19, line 3 of the present application.)

Applicant respectfully submits that Tamai does not teach or fairly suggest at least the features of Applicant's claims as recited above. As shown in Fig. 4 and described in the present application, Applicant's impedance converter includes operational amplifiers and a number of switches that are responsive to a polarity signal (106) provided to the impedance converter. In contrast, the circuit 63 of Fig. 4 in Tamai (which the Office Action characterizes as an impedance converter as recited by Applicant) comprises an array of switches AS1-AS8. A polarity signal of Tamai controls switches AS11-AS14, which are not part of the circuit 63 and, instead, appear to control the voltage across the resistors R1-R7, which are also not part of the circuit 63. Applicant submits that element 63 in Fig. 4 of Tamai does not include an impedance converter having the above-noted features, including at least one operational amplifier to receive the γ-voltages and Vcom voltages from the voltage generating block and that functions to produce the γ-correction voltages and Vcom-voltages according to a value of the polarity signal, as recited by Applicant. Furthermore, Applicant submits that that the structure show in Fig. 4 of Tamai appears to more generally correspond to the LCD driver 40 shown in Fig. 5 of the present application. The impedance converter 30 shown in the present application is disposed at a stage preceding the LCD driver 40.

Accordingly, in view of the above, Applicant respectfully requests that this rejection be reconsidered and withdrawn.

The rejection of claim 2 under 35 U.S.C. 103(a) as being unpatentable over Tamai in view of U.S. Patent No. 5,910,796 to Gormish (hereinafter "Gormish") is hereby traversed and reconsideration is respectfully requested in view of the amendments to the claims contained herein.

The features of claim 1 are discussed above with respect to Tamai. Claim 2 depends therefrom.

The Gormish reference discloses a method of performing gamma correction for a display device. The Office Action cites Gormish as disclosing software controlling and setting gamma correction signals.

Applicant respectfully submits that Gormish fails to overcome the above-noted deficiencies of Tamai with respect to Applicant's claimed invention. Gormish makes no reference to an impedance converter having the above-noted features and function as recited by Applicant. Accordingly, Applicant respectfully requests that this rejection be reconsidered and withdrawn.

Based on the above, Applicant respectfully requests that the Examiner reconsider and withdraw all outstanding rejections and objections. Favorable consideration and allowance are earnestly solicited. Should there be any questions after reviewing this paper, the Examiner is invited to contact the undersigned at 617-248-4038.

Respectfully submitted,
CHOATE, HALL & STEWART LLP

Date: May 18, 2005

Donald W. Muirhead
Registration No. 33,978

Choate, Hall & Stewart LLP
Exchange Place
53 State Street
Boston, MA 02109
Phone: (617) 248-5000
Fax: (617) 248-4000

3904216_1.DOC